

REMARKS

Applicants sincerely appreciate the detailed examination evidenced by the Official Action mailed January 5, 2005 (hereinafter the "Official Action"). Applicants also appreciate the allowance of Claims 16-28 and the indicated allowability of Claims 2 and 4-15 if rewritten in independent form. *Official Action, page 4*. Applicants have also added new Claim 29 which includes recitations that are similar to those in allowable Claim 2.

Accordingly, Applicants respectfully request the allowance of Claim 29 in due course.

Applicants have also included Replacement Sheets for Figures 3 and 5 including two changes suggested by the Examiner, which are discussed in further detail hereinbelow. Applicants respectfully request that the Examiner approve the Replacement Sheets for Figures 3 and 5.

In view to the above, the only remaining substantive issue for discussion is the rejection of Claims 1 and 3, which Applicants respectfully submit are patentable over Hung as written for at least the reasons described herein.

Replacement Sheets for Drawings 3 and 5 are included herewith

The drawings stand objected to under 37 C.F.R. 1.84(p)(5). *Official Action, page 2*. In response, Applicants have enclosed Replacement Sheets of Figures 3 and 5 as suggested by the Examiner. In particular, Figure 3 has been amended to include the reference numeral 318 associated with the plurality of word lines that couple the local row decoder circuit 305 to the sector 315A. Support for this amendment is provided, for example, at page 7, lines 9-13, of the Application. Applicants respectfully request approval of the Replacement Sheet for Figure 3 and the withdrawal of the objections thereto.

With regard to Figure 5, Applicants have enclosed a Replacement Sheet of Figure 5 showing the addition of reference designator 510. In particular, the reference designator 510 is associated with the bank select circuit including pass transistors 512 and 513 as described, for example, at page 9, lines 8-11, of the Application. Accordingly, Applicants respectfully request approval of the Replacement Sheet for Figure 5 and the withdrawal of the objections thereto.

The Specification has been amended as suggested by the Examiner.

The drawings have also been objected to 37 C.F.R. 1.84(p)(5). *Official Action, page 2*. In response, Applicants have amended the specification as suggested by the Examiner. In particular, the paragraph beginning at page 9, line 19, has been amended to include a reference to reference numeral 510 associated with the local row decoder circuit.

Applicants have also amended the paragraph beginning at page 10, line 15 to correct a typographical error (*i.e.*, 605 has been amended to 600) and to include a brief description of transistor 611 which is analogous to the transistor 511 shown in Figure 5, that is described, for example, at page 9, lines 14-16, of the Application. The description added to the paragraph beginning at page 10, line 15, is analogous to that cited above in reference to transistor 511. Applicants respectfully submit that no new matter is added by the amendments to the paragraph beginning at page 10, line 15. Applicants respectfully request the approval of the amendments to the specification described above and the withdrawal of the objections to the drawings.

The claims are patentable over Hung.

Claims 1 and 3 stand rejected under 35 U.S.C. § 102 over U.S. Patent No. 5,886,923 to Hung ("Hung"). *Official Action, page 3*. Applicants respectfully submit, however, that claims 1 and 3 are patentable over Hung for at least the following reasons.

Anticipation under § 102 requires that each and every element of the claim is found in a single prior art reference. *W. L. Gore & Associates Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983). Stated another way, all material elements of a claim must be found in one prior art source. *In re Marshall*, 198 U.S.P.Q. 344 (C.C.P.A. 1978). "Anticipation under 35 U.S.C. § 102 requires the disclosure in a single piece of prior art of each and every limitation of a claimed invention." *Apple Computer Inc. v. Articulate Systems Inc.* 57 USPQ2d 1057, 1061 (Fed. Cir. 2000). A finding of anticipation further requires that there must be no difference between the claimed invention and the disclosure of the cited reference as viewed by one of ordinary skill in the art. See *Scripps Clinic & Research Foundation v. Genentech Inc.*, 927 F.2d 1565, 1576, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). Additionally, the cited prior art reference must be enabling, thereby placing the allegedly disclosed matter in the possession of the public. *In re Brown*, 329 F.2d 1006,

1011, 141 U.S.P.Q. 245, 249 (C.C.P.A. 1964). Thus, the prior art reference must adequately describe the claimed invention so that a person of ordinary skill in the art could make and use the invention.

Applicants respectfully submit that Hung does not disclose, for example, a local row decoder circuit configured to drive word lines coupled to a bank of a flash memory **responsive to separate read and write control signals provided thereto from outside the local row decoder circuit**, as recited in the independent Claim 1. As understood by Applicants, Hung addresses the problem of unstable voltages on unselected global word lines:

a significant problem with the prior art is that the voltage levels of word lines associated with unselected global word lines are unstable, which can cause cells on unselected global word lines to be disturbed during programming. This problem can be solved using a local decoder with four transistors that collectively ensure that the voltage levels of local word lines associated with either selected or unselected address bits BXA_j tied to unselected global word lines GWL are at rock-solid levels that will not interfere with whatever memory operation is underway. *Hung, column 6, lines 13-23.*

In contrast to Hung, the present invention is directed to the problems associated with read-while-write capability in flash memories and the advantages that may be provided by controlling multiple row decoders using a single global decoder via separate read and write control lines. *Application, page 3, lines 21-32.* Accordingly, Hung and the present invention solve very different problems.

Moreover, Figures 3-5 of Hung illustrate that Hung does not disclose "a local row decoder circuit configured to drive word lines ... responsive to **separate read and write control signals** provided thereto **from outside the local row decoder circuit**," as recited in Claim 1. For example, Figures 3-5 of Hung show a **single** control line in GWLB connecting control circuit 304 with the local row decoder 308. Accordingly, as understood by Applicants, the local row decoder 308 in Hung receives a single control signal from outside (i.e., GWLB), not separate read and write control signals as recited in Claim 1.

It appears that the Official Action considers the signals A1, A2, CTLA, CTLB, etc., to disclose the separate read and write control signals recited in Claim 1. *Official Action, page 3.* However, according to Figures 3-5, the disclosure relied upon by the Official Action

appears to indicate that these signals are provided to the control circuit 304, not to the local row decoder 308. In fact, it appears that the control circuit 304 of Hung uses the control signals relied upon by the Official Action to generate the single control signal GWLB that is provided from outside the local row decoder circuit 308. As further evidence of the above, Applicants respectfully direct the Examiner to the following passages of Hung:

Referring to FIG. 3, there is shown a circuit diagram of preferred row decoder circuitry 300 associated with a single global word line GWL and a set of local word lines WLj. In the preferred embodiment, there are 8 local word lines WLj per global word line GWL; different numbers (e.g., 4, 16 or 32) of local word lines can also be associated with a global word line GWLs. *Hung, column 6, lines 54-57 (emphasis added); and*

...

Thus, the transistors T11 and T12 are capable of acting as switches connecting the output 303 of a global decoder 302 to the inputs of the corresponding local decoders 308. *Hung, column 7, lines 29-32 (emphasis added).*

As demonstrated by the above-cited passages of Hung, only a single control signal is provided to the local decoders, the local row decoder is separate from the control circuit 304 (*i.e., outside the local decoder*) which provides the single control signal GWL to the local row decoder 308.

As further evidence of the above, Applicants respectfully direct the Examiner to Tables 3 and 4 of Hung, which show that the read and write operations of the flash memory discussed therein are controlled by the single control line GWLB. In particular, Table 3 shows the status of signal lines associated with read mode. According to Table 3, the state of the control line GWLB conforms to the shown voltages therein. In contrast, Table 4 of Hung shows the same single control line GWLB during write mode. The voltage levels associated with GWLB during write mode are different than those provided during read mode (*i.e., in Table 3*). Accordingly, as understood by Applicants, the operations (*i.e., write/read mode*) of the flash memory in Hung is controlled by the single control signal GWLB.

Accordingly, Hung does not disclose, at least, "a local row decoder circuit configured to drive word lines...responsive to separate read and write control signals provided thereto from outside the local row decoder circuit" as recited in independent Claim 1. Furthermore,

Claim 3 is also patentable over Hung at least per the patentability of independent Claim 1. Applicants, therefore, respectfully request the withdrawal of the rejection of Claims 1 and 3 and the allowance thereof for at least these reasons.

Dependent Claim 3 is patentable over Hung.

Claim 3 stands rejected under 35 U.S.C. § 102 over Hung. *Official Action, page 3.* In addition to the reasons discussed above in reference to independent Claim 1, Applicants respectfully submit that dependent Claim 3 provides separate bases for patentability. In particular, Hung does not disclose, for example:

a global row decoder circuit, coupled to the local row decoder circuit **via the separate read and write control signals, and configured to activate the separate read and write control signals based on an address provided to the global row decoder circuit** that indicates memory cells associated with the address are accessed using the word lines.

As shown in Figures 3-5 of Hung, the global row decoder 302 is not coupled to the local row decoder 308 by separate read and write control signals. Furthermore, the global row decoder 302 does not activate the separate read and write control signals based on an address. To the contrary, even if the signals A1, A2, CTLA, CTLB, etc., were considered, for the sake of argument, to be separate read and write control signals, as understood by Applicants the global row decoder 302 would not activate these control signals as these signals are in-fact provided to the control circuit 304 from a source other than the global row decoder 302. Accordingly, Hung also does not disclose the recitations of Claim 3 for at least the additional reasons described above. Accordingly, Applicants respectfully request the withdrawal of the rejection of Claim 3 and the allowance thereof.

New Claim 29 is also patentable

Applicants have added new Claim 29, which recites in-part:

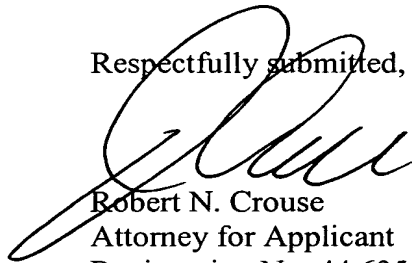
first and second banks of flash memory, wherein the flash memory supports read-while-write capability wherein a read operation in the first bank of the flash memory can be carried out simultaneous with a write operation in the second bank of the flash memory.

Applicants respectfully point out that new Claim 29 includes recitations that are similar to those found in allowable Claim 2. Furthermore, Applicants note that new Claim 29 has been added in response to the indication of allowability of the Claim 2, and not the art rejection of Claim 1. Accordingly, a full range of equivalents should be available to new Claim 29 independent of any determination of patentability. Accordingly, Applicants respectfully request the allowance of new Claim 29 for at least these reasons.

CONCLUSION

Applicants have shown herein that Claims 1 and 3 are patentable over Hung as written. Accordingly, Applicants respectfully request the withdrawal of all objections and rejections and the allowance of the remaining claims in due course. If any informal matters arise, the Examiner is encouraged to contact the undersigned by telephone at (919) 854-1400.

Respectfully submitted,

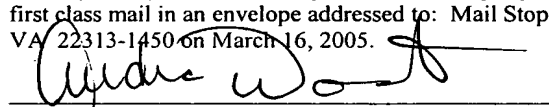


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Audra Wooten

In re: Lee et al.
Application No.: 10/622,278
Filed: July 18, 2003
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In the Drawings:

Applicants provide Replacement Sheets containing a revised Figures 3 and 5. Figure 3 has been revised to add reference numeral "318" to the plurality of word lines. Figure 5 has been revised to add reference numeral "510" to the bank select circuit.

Enclosure: 2 Replacement Sheets (Figures 3 and 5)